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(81) Designated States: AU, CA, JP, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).

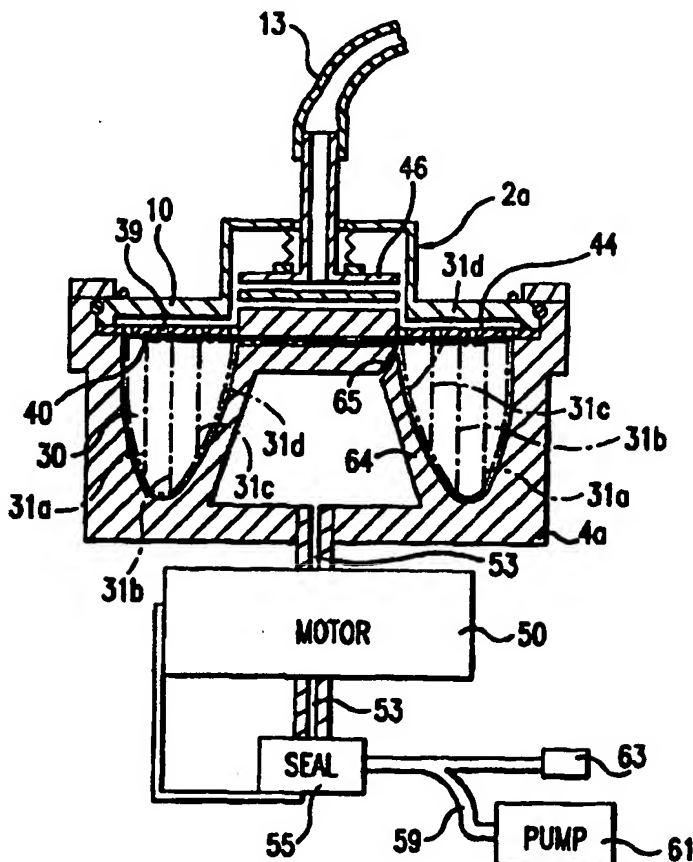
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11 July 1996 (11.07.96)

(54) Title: BLOOD PROCESSING SYSTEM

(57) Abstract

A rotor (2a-2e) for collecting and centrifuging biological fluids in a range of volumes. The rotor includes an elastic impermeable diaphragm (31) which defines at least a portion of a variable-volume processing chamber (30), where the fluid is centrifuged. The rotor includes a rigid mounting member (28), to which the diaphragm is mounted and which is held and spun by a chuck. Preferably, this rigid mounting member includes a boundary wall (10) which together with the elastic diaphragm defines the chamber. The boundary wall may be a substantially imperforate circular wall which extends to the periphery of the processing chamber but defining one opening, preferably near the axis of rotation, permitting a conduit (13) or conduits (83, 93, 163, 165, 188) to pass therethrough so as to be in fluid communication with the processing chamber. The rotor may include a separate structure (40, 190, 244) for controlling the flow of liquid out of the chamber into the conduit. In a preferred embodiment, this outlet-control structure is a perforate, substantially rigid wall or plate (40), located within the processing chamber and mounted adjacent the rigid boundary wall. In an alternative embodiment, the outlet-control structure for controlling flow from the processing chamber to the conduit may include at least one tube or preferably a set of tubes (190), wherein each tube provides fluid communication between the chamber and the conduit. In one preferred embodiment, grooves (244) in the boundary wall may be used as the outlet-control structure.



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INTERNATIONAL SEARCH REPORT

Int. No. Application No

PCT/US 95/13447

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 B04B5/04 A61M1/36

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 B04B A61M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US,A,3 737 096 (JONES ET AL.) 5 June 1973 see column 3, line 3 - line 25; figures 1-3 ---	1,3, 5-20,30, 38,45-54
X	US,A,5 316 540 (MCMANNIS ET AL.) 31 May 1994 see column 10, line 24 - line 36; figures 3, 5A-5D Y see figure 3 ---	1,3, 5-20,30, 38,45-54
P,X	US,A,5 368 542 (MCMANNIS ET AL.) 29 November 1994 see the whole document ---	2 1
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☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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* "&" document member of the same patent family

Date of the actual completion of the international search

29 March 1996

Date of mailing of the international search report

17. 04. 96

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Ehram, F

INT. NATIONAL SEARCH REPORT

In. tional Application No

PCT/US 95/13447

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US,A,5 045 048 (KALESKAS ET AL.) 3 September 1991 see column 4, line 34-54; figure 1 ---	2
A	US,A,4 734 089 (CULLIS) 29 March 1988 see column 4, line 35 - line 41; figure 5 ---	4
A	US,A,4 530 691 (BROWN) 23 July 1985 see column 3, line 29 - column 4, line 66; figures 1-4 ---	1,3,5-20
A	US,A,4 940 543 (BROWN ET AL.) 10 July 1990 see column 7, line 13 - line 31; figures 2-9 ---	1
A	FR,A,2 258 898 (HERAEUS-CHRIST G.M.B.H.) 22 August 1975 see claim 1; figures 1,2 -----	1

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 95/ 13447

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.: 33-37, 39-44, 60-63, 72-75, 77-81
because they relate to subject matter not required to be searched by this Authority, namely:
Method of treatment of the human body.
Please see Rule 39.1(iv) PCT.
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

PLEASE SEE ANNEX

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International Application No. PCT/US95/ 13447

FURTHER INFORMATION CONTINUED FR M PCT/ISA/210

A. Claims 1,3-20 :

A rotor for use in a centrifuge system.

Claims 30-32,38,45,46-53,54 :

A system for separating fluid comprising a rotor according to claims 1-20.

Claims 55-59,64-69,70-71,76,82 :

Method of processing biological fluids of different densities.

B. Claims 2,21-29,83-85,86 :

A rotary seal for a rotor of claim 1.

INTERNATIONAL SEARCH REPORT

Information on patent family members

Inventor Application No

PCT/US 95/13447

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Information on patent family members

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